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CONTENTS.

	PAGE
The Future of the Medical Profession. By Charles W. Eliot, LL. D.	347
The Unity of the Medical Sciences. By William H. Welch, M. D.	350
Remarks upon the International Congress of Tuberculosis, Paris, 1905. By Henry Barton Jacobs, M. D.	354
Governor John Winthrop, Jr., of Connecticut, as a Physician. By Walter R. Steiner, A. M., M. D.	357
The Advantages of Local Sanatoria in the Treatment of Pulmonary Tuberculosis. By David R. Lyman, M. D.	361
Notes on New Books	364

THE FUTURE OF THE MEDICAL PROFESSION.[1]

By Charles W. Eliot, LL. D.,

President of Harvard University.

The future occupations and interests of the medical profession are to be in some respects different from those of the past, and they are to be more various. The ordinary physician has for the last hundred years been almost exclusively a man devoted to the treatment of diseases already developed in human bodies or of injuries already incurred. He made his diagnosis, and then sought remedies and a cure. He was the sympathetic and skillful helper of sick or injured persons. Most of the cases that came under his care were cases considered plain as to symptoms, period and accepted treatment. The minority of cases were obscure, and called for unusual knowledge and skill in discerning the seat of the disorder, or the approximate cause of the bodily disturbance. Hence the special value of the experienced consultant, who was ordinarily a man of some peculiar natural gift of body, mind, or temperament, possessing also in high degree the faculty of keen observation, and the habit of eliminating irrelevant considerations, and ultimately finding his way to the accurate, limited inference from the facts before him. Both the ordinary physician and the consultant have already been much helped by the extraordinary progress made in medical science during the last thirty years, but they have been helped, chiefly, to a surer recognition of diseases established in human bodies, and to a better treatment of their patients' diseases when recognized.

The physician or surgeon commonly renders a personal service to an individual, sometimes for a pecuniary recompense, but often without money compensation. He is often a trusted adviser in the most intimate family concerns. Births and deaths alike bring the physician into the home. In rendering these services he must be tender, sympathetic, considerate, pure-minded and judicious. There will always be need, crying need, of the physician and surgeon in this sense and for these functions; and whatever else the regular education of the physician provides in the future, it must provide all the elements of the best training for the practising physician who is to treat diseased or crippled human bodies, and give advice about the sudden and the chronic ills which afflict humanity. So much will continue to be demanded of all good medical schools; but much more they must do.

The progress of what we call civilization exposes human beings more and more to the ravages of disease. When savages come in contact with men called civilized, they invariably suffer from diseases new to them. When a rural population crowds into cities, it falls a victim to diseases from which in the country it had been exempt. When hundreds of thousands of people huddle into small areas and create there smoke, dust and noise, they suffer not only from new diseases, but from the exacerbation of diseases not wholly unknown to them in

[1] Address delivered, Sept. 26, 1906, in Sanders Theatre, Cambridge, on the occasion of the dedication of the new buildings of the Harvard Medical School.

the rural condition. Under such favorable conditions of residence and labor the human body degenerates in many respects, and, losing vigor, becomes in some respects less able to resist the attacks of disease.

Against these bodily evils which result from civilization the physician has thus far struggled chiefly by treating more or less successfully the numerous individuals who are attacked by disease. Doubtless, the treatment of sick and injured persons has substantially improved, but, nevertheless, the death-rate in our cities diminishes slowly, and the heavy economic losses which result from disease and premature death continue. Moreover, the improvement of treatment in hospitals and private practice has been accompanied by a great increase in the cost of treatment, so that the charges upon the community resulting from sickness and injuries have, within the last thirty years, rapidly mounted, and these heavy charges are, after all, incurred for the palliation of evils already suffered, and not for the prevention of such evils. Again, in different parts of the habitable globe, mankind has been exposed for centuries to dangers more or less localized,—in one region to the attacks of venomous reptiles; in another of fierce carnivora; in another to the ravages of flights of insects which devour every green thing; in another to the constant presence of formidable diseases.

For the most part, the human race has learned how to exterminate the offending creatures, or at least, to limit their ravages; and where grave infectious diseases are always present, in greater or smaller degree, or frequently recur, a considerable proportion of the population becomes in some degree immune to them. Mankind is now in face of enemies which are not localized, but which, on the contrary, are carried all over the habitable globe on the ubiquitous routes of travel and commerce. The worst of the new enemies are minute, multitudinous and mysterious, in that their relations and connections are unknown; they infest many of the animals with which man is associated, or pass into man from the animals and plants of which he makes use. Untrammeled dissemination of noxious things has taken the place of centuries-long localization, a localization which sometimes secured checks, antidotes, or immunities. Since then, modern society cannot help incurring new risks; it should seek new defenses. These defenses it may reasonably expect medical education to plan, and public and private expenditure to provide.

If civilized society is to endure under its new exposures and dangers, it is clear that the medical profession must take up with new ardor the work of preventing approaching disease in addition to the work of treating disease arrived. The profession must recognize that health is eminently a social product, just as the psychologists have recognized that the mind of a civilized man is a social product.

When we consider what has already been learned about the production, transmission and prevention of smallpox, cholera, yellow fever, the black death, typhoid fever, diphtheria, anthrax, rabies and tetanus, we cannot resist the conclusion that in the future medical science must include the study of causes and sequences which will carry the student through a large portion of the animal and vegetable kingdoms, and particularly into the habits and habitats of their minute parasitic forms. Systematic medical education must therefore produce a considerable number of men capable of studying in this region the causes of disease, and the ways of interrupting the means of communication, or breaking the chain of sequences, through which at last the germs of disease get a chance to produce their malignant effects within the human body. Considering the great obscurity of the physiological processes which go on within the body and the dense ignorance of mankind concerning the microscopic animal kingdom, it is a great wonder that medical science in its imperfect state has constructed so many effective defenses against disease within the last thirty years. Indeed, we are now using some efficient defensive methods, the real nature of which we but imperfectly understood, as, for instance, the vaccinations against smallpox and hydrophobia. Although we are not yet able absolutely to prevent disease, we are able in many cases to restrict the communication of diseases and to modify their course in the individuals attacked.

The medicine of the future has, therefore, to deal much more extensively than in the past with preventive medicine, or, in other words, with the causes of disease as it attacks society, the community, or the state, rather than the individual. The object in view will be not only to arrest or modify a malady which has appeared in the body of a patient, but, as in the recent case of yellow fever, to learn how the disease is communicated and how to prevent that communication. The study of mitigations, remedies and cures is to continue; but the study of the causes of disease and the means of prevention is to be greatly developed. The function of the nineteenth century physician will continue, and, indeed, will become more effective through a better knowledge of the forces which may be made to act upon his patient, both from within and from without; but another sort of physician will be at work in the twentieth century, preventing the access of epidemics, limiting them when they arrive, defending society against bad food and drink, and reducing to lowest terms the manifold evils which result from the congestion of population.

The explorers and pioneers in medical science must be encouraged to press on their patient work of analyzing all the processes which accompany disease, in order that they may learn their actual sequences. Only through the knowledge of these sequences can real control over disease be certainly gained. And this work will be endless; for civilization involves constant changes in the environment of the human race; and it is on medical science that the race must depend for protecting it from the new dangers which accompany each novel environment. The medical scientists being provided and furthered, medical education must also train large bodies of men to clear and cultivate the regions through which the pioneers have made trails, or, in plainer words, to apply to millions of men and women in all sorts of climate and environment the discoveries of the scientists. Thus thousands of physicians all over our southern states must for years be teaching the people how to protect themselves from yellow

fever. Major Walter Reed and his colleagues proved how yellow fever is communicated, and—what was equally important—how it is not communicated; but thousands of medical men must see to it that intelligent application is made of that precious knowledge.

Recent events have brought into strong light a new function of the medical profession which is sure to be amplified and made more effective in the near future. I mean the function of teaching the whole population how diseases are caused and communicated, and what are the corresponding means of prevention. The recent campaign against tuberculosis is a good illustration of this new function of the profession. To discharge it well requires, in medical men, the power of interesting exposition, with telling illustration and moving exhortation. Obviously, the function calls for disinterestedness and public spirit on the part of the profession; but to this call it is certain that the profession will respond. It also calls for some new adjustments and new functions in medical schools, which should hereafter be careful to provide means of popular exposition concerning water supplies, foods, drinks, drugs, the parasitic causes or consequences of disease in men, plants and animals, and the modes of communication of all communicable diseases.

Medical museums should be arranged, in part, for the instruction of the public, and, with some suitable reservations, should be statedly open to the public. The medical schools should also habitually provide popular lectures on medical subjects, and these lectures should be given without charge on days and at hours when working people can attend. In other words, selected physicians should become public preachers, as well as private practitioners. America has much to learn from Europe in regard to this public-spirited service on the part of the profession.

In another respect the teaching of medicine must be broadened in the century we have now entered on. Medical study has been, in time past, far too exclusively the study for man's body by itself. Hereafter, the study of medicine must be largely comparative, or, in other words, must include man's relations to the animal and vegetable kingdoms. The Harvard Medical School enters into possession of its new buildings with three professorships of comparative medicine already established,—the professorships of comparative anatomy, comparative physiology and comparative pathology. This tendency to comparative study has been already well developed in other subjects, as, for example, in comparative psychology, legislation and religion. Wherever this study by comparison wins adequate place, it makes the study of the subject broader and more liberalizing, and the results obtained more comprehensive and just.

Medical students should, therefore, have studied zoölogy and botany before beginning the study of medicine, and should have acquired some skill in the use of the scalpel and microscope. It is absurd that anybody should begin with the human body the practice of dissection or of surgery; and, furthermore, it is wholly irrational that any young man who means to be a physician should not have mastered the elements of biology, chemistry and physics years before he enters a medical school. The mental constitution of the physician is essentially that of the naturalist; and the tastes and capacities of the naturalist reveal themselves, and, indeed, demand satisfaction long before twenty-one years of age, which is a good age for entering a medical school. The Harvard Medical School has derived great advantages from its requirement of a previous degree for admission; but in view of the fact that many young men procure a bachelor's degree without ever having studied any science, the school needs an additional and more specific requirement, namely, a previous knowledge of biology, physics and organic chemistry, and an acquaintance with laboratory methods in all three subjects.

As at the preliminary stages of the medical career, so at its climax there is an increasing need of men who have a working knowledge of several sciences which were formerly treated as distinct, and whose best representatives in medical schools labored apart, each in his own field. The most promising medical research of our day makes use of biological, chemical and physical science combined. Physiology advances by making applications of the principles, the methods, and the implements of all three sciences. The physiologist listens to the normal or abnormal sounds in the bodies of men and animals with a modified telephone, and may record by electricity almost all the phenomena he studies. Bacteriology and biological chemistry go hand in hand in serving pathology and the public health.

A great number of new chemical substances, coming from organic sources, and yet as definite and uniform in composition as salt or alum, prove serviceable in pharmacology and in physiological and pathological research, although they were neither discovered nor manufactured with any such purpose in view. The stainings of bacteriological technique, and the quantitative color tests for characteristic ingredients in the various secretions of the body, ingredients which fluctuate in amount in health or in disease, illustrate the present dependence of medical research on chemistry and physics.

For the effective study of the toxins and antitoxins, within and without the body, the bacteriologist and the biological chemist must co-operate. Many of the effects produced by the toxins in the living body are definite chemical changes, such, for instance, as may be produced by the activation of certain ferments, and the antagonism of toxin and antitoxin is probably a chemical reaction. Many of the great discoveries of the future will come through the cooperation of sympathetic groups of medical scientists representing different modes of attacking the same problem. There will be a like necessity for cooperation between the clinician, the pathological anatomist, the physiological chemist and the bacteriologist.

The world has observed and will not forget that some of the greatest contributors to the progress of medicine and surgery during the past thirty years have been, not physicians, but naturalists and chemists. Pasteur was a chemist; Cohn, the teacher of Koch, a botanist, and Metschnikoff, a zoölogist. Students of disease must, therefore, be competent to utilize

in their great task every aid which natural science can furnish. How vastly is the range of medical science and medical education broadened by this plain necessity! The dignity and serviceableness of the medical profession are heightened by every new demand on the intelligence and devotion of its members.

The recent liberal endowment of the Harvard Medical School by private persons is an indication that the more intelligent and public-spirited portion of the American people is beginning to understand that most diseases would be preventable if only mankind had acquired the knowledge needed to prevent them. The urgent duty of society to-day is to spend the money needed to get that knowledge. How to spend it we have learned; witness the admirable work of the Massachusetts Board of Health for thirty years past, aggressive work, both defensive and offensive; witness also the remarkable results of the medical institutes, both in this country and in Europe.

The medical profession of the future will have the satisfaction not only of ameliorating the condition or prolonging the life of the suffering individual, but also of exterminating or closely limiting the preventable diseases.

THE UNITY OF THE MEDICAL SCIENCES.[1]

By William H. Welch, M. D.

The dedication of the new buildings of the Harvard Medical School is an occasion for rejoicing not to Harvard University alone but to all in this country and elsewhere interested in the progress of medical education and of medical science, and in behalf of all such I beg to offer to this University hearty congratulations upon this magnificent addition to its resources for medical teaching and study. Medicine everywhere and especially in America has reason to be profoundly grateful to the generous and public-spirited donors who have made possible the construction of this group of buildings, unsurpassed in the imposing beauty and the harmony of their architectural design and in their ample, internal arrangements. This design is adapted from the Greek, and it is peculiarly fitting that the medical sciences should be housed in a style which suggests the spirit of ancient Greece, where first flowed the springs of medical science and art—living springs even to this day. In the singular harmony of the architecture of the group of buildings devoted to the various medical sciences are typified the unity of purpose of these sciences and their combination into the one great science of medicine. What I shall have to say on this occasion is suggested in part by this thought of the "Unity of the Medical Sciences."

The good fortune of the Harvard Medical School in coming into possession of the splendid laboratories now formally dedicated is well merited by the leading position which this institution has held in this country since its foundation, by its union with Harvard University, and by the assurance that the greatly enlarged opportunities will here be used to the highest advantage. Since the appointment in 1782 of its first professors, John Warren and Benjamin Waterhouse, of enduring fame, this school has had a long line of honored names upon its roll of teachers, lustrous not only for such single stars as Channing and Ware and Holmes and Ellis and Cheever, but especially for its clustered stars, the Warrens, the Jacksons, the Bigelows, the Shattucks, the Wymans, the Bowditches, the Minots; and it will not be deemed invidious on this occasion to mention of the latter group the names of two members of the present distinguished faculty to whose services this school is so largely indebted for securing the funds for the new buildings, Professor Henry P. Bowditch, the eminent leader of American physiologists, and Professor John Collins Warren, who, as surgeon, writer and teacher, has so worthily maintained and enhanced the ancestral fame.

The Harvard Medical School has been a pioneer in this country in many improvements of medical education; it has stood successfully in an historic city and commonwealth for high standards of professional attainment and honor, and for just recognition of the dignity and usefulness of the profession; it has made valuable contributions to the advancement of medical knowledge and practice, and above all there issued from this school and the Massachusetts General Hospital through John Collins Warren, the elder, and Samuel G. Morton medicine's supreme gift to suffering humanity of surgical anæsthesia.

This school, however, has no possession so valuable or which gives such assurance of its stability and growth for untold generations to come and of the worthy bestowal of the great gifts which were dedicated yesterday as its union with Harvard University, and it is befitting that the significance of this university relationship should be emphasized by including among the dedicatory ceremonies this academic function in the halls of this great university.

The severance of the historical union of medical school and university, leading to the establishment of a multitude of independent medical schools without responsible control, and usurping the right to confer the doctor's degree and the license to practise, is accountable in large measure for the low position to which medical education in this country sank during the larger part of the last century, and from which it has now risen in our better schools to a height which we can contemplate with increasing satisfaction. Nor would it be difficult to show, if this were the suitable occasion, that

[1] An address delivered September 26, 1906, at Harvard University, at the dedication of the new buildings of the Harvard Medical School.

our universities on their side have suffered from the loss of a member which has brought renown to many foreign universities and that many of the embarrassing anomalies of our collegiate system of education are due to lack of personal contact on the part of colleges and universities with the needs of professional, especially medical, training. There is, of course, no saving grace in a merely nominal connection of medical school and university; the union to be of mutual benefit must be a real and vital one; ideals of the university must inspire the whole life and activities of the medical department.

To have recognized fully, from the beginning of his administration, the importance of this vitalizing union of the medical school with the university, to have striven patiently with full grasp of the problems and with intelligent sympathy with the needs of medicine for the uplifting of the standards of medical education, and, with the aid of his medical colleagues, to have planted these standards where they now are in the Harvard Medical School, is not the least of the many enduring services which President Eliot has rendered to American education, and, in behalf of our profession, I wish to make to you, sir, on this occasion, grateful acknowledgment of this great and beneficent work.

The opening of the new laboratories of the Harvard Medical School marks the culmination, up to the present time, of an educational and scientific movement which has been the most distinctive characteristic of the development of medicine during the past fifty years, and which has transformed the face of modern medicine. To have some idea of the extent and the direction of this development, consider how inconceivable would have been the mere existence of such laboratories a century ago, and how impossible it would have been for even a Bichat or a Laënnec to have put them to any use or to have imagined their use. The only scientific laboratory which existed at that time was the anatomical, and this had been in existence for at least two hundred and fifty years, although not in a form which meets our present ideas of such a laboratory.

The modern scientific laboratory was born in Germany in 1824 when Purkinje established the first physiological laboratory, thus antedating by one year the foundation of Liebig's chemical laboratory, which had a much greater influence upon the subsequent development of laboratories. As might naturally be expected, anatomical and physiological laboratories had attained a considerable development before the first pathological laboratory was founded in Berlin by Virchow. The opening and activities of this laboratory, which has recently celebrated its fiftieth anniversary, mark an era in the progress of medicine. With the exception of the modest beginning of a pharmacological laboratory by Buchheim about 1850, all of the other medical laboratories—those of physiological chemistry, of hygiene, of bacteriology, of clinical medicine—originated at a much later date.

This remarkable growth of laboratories for the cultivation of the various medical sciences has been at once the cause and the result of the rapid progress of medicine in recent years. By teaching and exemplifying the only fruitful method of advancing natural knowledge, laboratories have overthrown the dominance of authority and dogma and speculation and have turned medicine irrevocably into the paths of science, establishing the medical sciences as important departments of biology; by demonstrating that the only abiding, living knowledge, powerful for right action, comes from intimate, personal contact with the objects of study, they have revolutionized the methods of medical teaching; by discovery they have widened the boundaries of old domains and opened to exploration entirely new fields of knowledge, by the application of which man's power over disease has been greatly increased.

Medicine, as a science, is occupied with the systematic study of the structures and functions of the human and animal body in health, of their changes by disease and injury, and of the agencies by which such morbid changes may be prevented, alleviated or removed. Its ultimate aim, which indicates also its method, is that of all science, the deduction of general concepts and laws from the comparison of the relationships and sequences of ascertained facts, and the application of these laws to the promotion of human welfare. This goal, to-day far from realization, is most nearly approached where the principles of physics and of chemistry can be applied, but there remains a large biological field awaiting reclamation for the application of these principles. The subject-matter of medical study, as thus indicated, is of supreme import to mankind, but complex and difficult far beyond that of any other natural or physical science.

The places where such study may be most advantageously carried on are laboratories and hospitals supplied with the material for study, with the necessary instruments, appliances and books, and with trained workers. By growth of medical knowledge the field to be covered has become so vast as to require much subdivision of labor, nor is it to be supposed that the end of this subdivision has been even approximately reached.

From human anatomy, the mother of medical as well as of many other natural sciences, there branched off in the eighteenth century physiology, and, still later, pathological anatomy. As if to replace these losses anatomy gave birth to comparative anatomy, embryology and microscopic anatomy as more or less separate branches. During the past century physiological chemistry and pharmacology have separated from physiology, and comparative pathology and experimental pathological physiology are asserting their independence from pathological anatomy. Hygiene and bacteriology are of recent and more independent growth. The latter, lusty stripling, with the rise of medical zoology, especially protozoology, is seeking a more comprehensive and appropriate designation. The latest and perhaps the most significant development is the clinical laboratory in its various forms.

Specialization in scientific work should not be decried; it is demanded by the necessities of the case and has been the great instrument of progress, but the further division of labor is carried, the more necessary does it become to emphasize

essential unity of purpose and to secure coordination and cordial cooperation of allied sciences. Especially urgent is full recognition of the unity and cooperation of the clinic and the laboratory.

During the last two decades we have witnessed in this country the extraordinary rise of practical laboratory instruction from the weakest to the strongest and best organized part of the medical curriculum of our better schools. Our laboratory courses are, I believe, in several instances, more elaborate and occupy more time than corresponding ones in most foreign universities.

It is, however, as was emphasized by Dr. Dwight and Dr. Shattuck in their remarks yesterday, an error to suppose that from the point of view of science any fundamental distinction exists between the clinical and the so-called laboratory subjects other than that based upon differences in the subject-matter of study. The problems of the living patient are just as capable of study by scientific methods and in the scientific spirit, and they pertain to independent branches of medical science, just as truly as those of anatomy, physiology or the other so-called laboratory subjects. All of the medical sciences are interdependent, but each has its own problems and methods, and each is most fruitfully cultivated for its own sake by those specially trained for the work.

There is a highly significant and hopeful scientific movement in internal medicine and surgery to-day characterized by the establishment of laboratories for clinical research, by the application of refined physical, chemical and biological methods to the problems of diagnosis and therapy, and by the scientific investigation along broad lines of the special problems furnished by the living patient. The most urgent need in medical education at the present time in this country I believe to be the organization of our clinics both for teaching and for research in the spirit of this modern movement and with provision for as intimate, prolonged, personal contact of the student with the subject of study as he finds in the laboratory.

In addition to undergraduate instruction our laboratories at present furnish better opportunities for the prolonged, advanced training of those intending to make their careers in anatomy, physiology, pathology and other sciences, than are afforded by most of our hospitals to those who aim at the higher careers in medicine and surgery. A further clinical disadvantage is that while the former class after good scientific work may reasonably look forward to desirable positions as teachers and directors of laboratories, the latter, however high their attainments, in consequence of the separation of the medical school from any control over the appointments to the hospital staff, cannot anticipate with any degree of assurance similar promotion in their chosen lines of work, and consequently the medical faculty has not so wide a field of choice in filling the clinical chairs as in filling those of the auxiliary sciences.

The removal of these deficiencies on the clinical side of medical education in America requires some reorganization of its staff on the part of the hospital and the control by the medical school of its hospital, or, at least, its voice in appointments to the hospital staff. So far as our resources permit, we have, I think, accomplished this reform at the Johns Hopkins Medical School and Hospital.

The welfare of the patient is the first obligation of the trustees of hospitals and of physicians in attendance, but nothing is more certain than that cordial cooperation between medical school and hospital best subserves the promotion of this welfare. Fortunate the hospital and fortunate the patients brought into such relations with the Harvard Medical School.

As is strikingly illustrated by the new buildings of this school, the educational machinery of medicine to-day is vastly complicated and costly compared with the simplicity of the days when a lecture room, a dissecting room, a simple chemical laboratory, and a clinical amphitheatre were all that was needed. The purpose of medical education, however, remains to-day what it has always been and will continue to be—the training of the student for the future practice of his profession, and to this end in an harmonious scheme of education the various medical sciences all work together. Right action requires abundant knowledge, nowhere more so than in medical practice, and the all-sufficient justification for the position held by the various sciences in the preliminary and the professional education of the physician is that they furnish knowledge and discipline of mind needed in the preparation for his future work. The social position of the medical man and his influence in the community depend to a considerable extent upon his preliminary education and general culture. For this reason, as well as for his intellectual pleasure in his profession and as a sound foundation for his future studies, the student should enter the medical school with a liberal education, which should include training in the sciences fundamental to medicine.

The unity of the various medical sciences is manifested not only in their historical development and in their co-operation in the scheme of medical education, but especially in their contributions to the upbuilding and progress of medicine as a whole.

There is no branch of medicine or even of physical science which has not played an important part in the evolution of our present medical knowledge and beliefs. The great lesson taught by the history of this development of medicine through the centuries has been the unconditional reverence for facts revealed by observation, experiment, and just inference, as contrasted with the sterility of mere speculation and reliance upon transmitted authority. The great epochs of this history have been characterized by some great discovery, by the introduction of some new method, or by the appearance of some man of genius to push investigation and scientific inference to limits not attainable by ordinary minds. The history of medicine has a greater unity and continuity, and extends over a longer period of time, than that of any other science.

The first clear note, which has rung down the ages, was sounded by Hippocrates when he taught the value of the in-

ductive method by simple, objective study of the symptoms of disease, and the cry "Back to Hippocrates!" has more than once recalled medicine from dogmas and systems into sane and rational paths. Medicine, however, was handed on from the Greeks and Romans in bondage to a system of doctrine, constructed by Galen, so completely satisfying to the mediæval mind that this system remained practically untouched for over a thousand years.

With the liberation of intellect through the renaissance came the great emancipators, in the sixteenth century Vesalius, and in the seventeenth, Harvey, the former placing human anatomy upon a firm foundation and bringing medicine into touch with the most solid basis of fact in its domain, the latter bringing to light in the demonstration of the circulation of the blood the central fact of physiology and applying for the first time in a large and fruitful way to medicine the most powerful lever of scientific advance, the method of experiment.

In the century of Galileo, Harvey and Newton instruments of precision, as the chronometer, the thermometer, the balance, the microscope, were first applied to the investigation of medical problems, and physics began to render those services to medicine which, continued from Galileo to Röntgen, have been of simply incalculable value. The debt of medicine to chemistry began even with the rise of alchemy, received an immense increment from the researches of Lavoisier, the founder of modern chemistry, concerning the function of respiration and the sources of animal heat, and has grown unceasingly and to enormous proportions up to these days of physical chemistry, which has found such important applications in physiology and pathology.

How disastrous may be to medicine the loss of the sense of unity in all its branches has been very clearly and admirably shown by Professor Allbutt in depicting the effects which, for centuries, followed the casting off from medicine of surgery as a subject unworthy the attention of the medical faculty. Thereby internal medicine lost touch with reality and the inductive method, and remained sterile and fantastic until the days of Harvey, Sydenham and Boerhaave. The services of surgery to medicine as a whole, so brilliantly exemplified in the experimental work of John Hunter in the eighteenth century, have become a distinguishing feature of the medicine of the present day.

The great awakening of clinical medicine came in the early part of the nineteenth century from the introduction of the new methods of physical diagnosis by Laënnec and from pathological anatomy. The subsequent development of scientific and practical medicine has far exceeded that of all the preceding centuries. It has kept pace with the progress during the same wonderful century of all the sciences of nature and has contributed even more to the promotion of human happiness.

In anatomy with embryology and histology, in physiology, pathology, physiological chemistry, pharmacology, hygiene, bacteriology—sciences which are ancillary to medicine and at the same time important branches of biological science—there have been marvelous activity and expansion. For physiology and the understanding of disease, the establishment of the cell doctrine by the aid of botany, embryology, and pathology has been the greatest achievement. By the combined aid of physiology, physiological chemistry, experimental pathology, improved methods of diagnosis and clinical study, medicine has gained new and higher points of view in passing from too exclusive emphasis upon the final stages of disease revealed by morbid anatomy to clearer conceptions of the beginning and progress of morbid processes as indicated by disturbances of function, and above all has penetrated to the knowledge of the causation of an important class of diseases, the infectious. As a result of this rapid growth of knowledge in many directions has come a great increase of the physician's power to do good by the relief of suffering and the prevention and cure of disease.

In this connection I wish especially to emphasize the mutual helpfulness of the various medical sciences in the development of medical knowledge and practice. Attention is generally so concentrated upon the final achievement that there is danger of losing sight of the manifold sources which have contributed to the result. Let my medical hearers consider, for example, the indispensable share of embryology, of anatomy, gross and microscopic, of physiology, of pathological anatomy, of clinical study in the evolution of our knowledge of the latest contribution to diseases of the circulatory system —that disturbance of the cardiac rhythm called "heart-block." Similar illustrations of the unity of the medical sciences and of the cooperation of the laboratory and the clinic might be multiplied indefinitely from all classes of disease.

The same phenomenon is exhibited in medicine as in all science, that the search for knowledge with exclusive reference to its practical application is generally unrewarded. The student of nature must find his satisfaction in search for the truth, and in the consciousness that he has contributed something to the fund of knowledge on which reposes man's dominion over reluctant matter and inexorable forces.

How readily better action attends upon increased knowledge is shown by the part which the art of medicine is playing and is destined to play even more prominently in the world's progress. The value of this work of modern medicine is to be measured in part, but only in part, by the standard applied by the average man, namely, improvement, which, indeed, has been great, in the treatment of disease and injury. It is, however, its increasing power to check the incalculable waste of life, of energy, of money from preventable disease that places medicine to-day in the front rank of forces for the advancement of civilization and the improvement of human society. Economists and other students of social conditions have begun to realize this, but governments and the people are not half awake, and medicine, shaking off all mystery and with a sense of high public duty, has before it a great campaign of popular education.

The knowledge which has placed preventive medicine upon a sound basis and has given it the power to restrain and in some instances even to exterminate such diseases as cholera,

plague, yellow fever, malaria, typhoid fever, tuberculosis and other infections, has come from exploration of the fields opened by Pasteur and by Koch. This power and the certainty of increasing it has given great strength to appeals for the endowment of medical research and the construction of laboratories. What is all the money ever expended for medical education and medical science compared with the one gift to humanity of Walter Reed and his colleagues of the Army Commission—the power to rid the world of yellow fever?

Great as has been the advance of medicine in the past half century, it is small indeed in comparison with what remains to be accomplished. Only a corner of the veil has been lifted. On every hand there are still unsolved problems of disease of overshadowing importance. The ultimate problems relate to the nature and fundamental properties of living matter, and the power to modify these properties in desired directions. Here our levers are far from the satisfactory fulcrum. But knowledge breeds new knowledge, and we cannot doubt that research will be even more productive in the future than it has been in the past. It would be hazardous in the extreme to attempt to predict the particular direction of future discovery. How unpredictable even to the most far-sighted of a past generation would have been such discoveries as the principles of antiseptic surgery, antitoxins, bacterial vaccines, opsonins, the extermination of yellow fever or malaria by destruction of a particular species of mosquito, and many other recent contributions to medical knowledge!

The activities within the new buildings of the Harvard Medical School begin at a period of medical development full of present interest and full of hope for the future, and it may be confidently predicted that they will have an important share in the onward movement, educational and scientific, of medicine.

One side of these activities will be devoted, under conditions most admirable as regards teachers, methods and opportunities, to the training of medical students and to advanced instruction. Supplemented by similar opportunities for undergraduate and advanced training in the hospital wards and dispensary, these conditions will be ideal.

The inspection of these noble new buildings, however, shows clearly that those who have planned them with such care, foresight and sagacity, while recognizing fully their important educational uses, have had also another and a main thought in their arrangements, namely, their adaptation to the purposes of original research. It is this dual function of imparting and of advancing knowledge which justifies the expenditure of money and which insures a return of the capital invested in buildings, equipment, and operation with a high rate of interest in the form of benefits to mankind.

The most ample and freely available facilities are an important condition for productive research, but on this creative side of university work men count for more than stately edifice and all the pride and pomp of outward life. Research is not to be bought in the market-place, nor does it follow the commercial law of supply and demand. The multitude can acquire knowledge; many there are who can impart it skillfully; smaller, but still considerable, is the number of those who can add new facts to the store of knowledge, but rare indeed are the thinkers, born with the genius for discovery and with the gift of the scientific imagination to interpret in broad generalizations and laws the phenomena of nature. These last are the glory of a university. Search for them far and wide beyond college gate and city wall, and when found cherish them as a possession beyond all price.

By the possession of investigators such as these, by the character and work of teachers and taught, by the advancement of knowledge and improvement of practice, may this new home of the Harvard Medical School be a centre for the diffusion of truth in medicine, the abode of productive research, a fortress in the warfare against disease, and thereby dedicated to the service of humanity!

REMARKS UPON THE INTERNATIONAL CONGRESS OF TUBERCULOSIS, PARIS, 1905.[1]

By Henry Barton Jacobs, M. D.

The International Congress of Tuberculosis held in Paris October, 1905, was attended by three or four thousand people interested in the work of the Congress. To realize why such a large number of people should have been brought together, consider for a moment the importance of the work; tuberculosis is by far the greatest scourge of the human race. Wars, smallpox, yellow fever, plague, railway disaster, these cause momentary outbursts of great excitement and fear, even heavy mortality, but this mortality is small as compared to this silent, ever-present foe, tuberculosis, which so stealthily and yet so unceasingly lies in wait for its victims.

The statistics of our own city may be taken as a fairly accurate expression of the statistics of the whole civilized world; notice them week by week, always the same thing; deaths from tuberculosis leading the list, except perhaps now and then in the winter months when pneumonia may run ahead, but season in and season out it is tuberculosis which is killing the greater number of the people. This fact alone would seem sufficient to incite men and women to an interest in its study, but when we consider that it has been completely demonstrated that this disease is dependent upon an agency which can be *destroyed* and can be *avoided* so that the disease need not exist, then we realize more fully the interest called forth

[1] Read at a meeting of the Laennec Society, March 19, 1906.

the world over in all efforts to comprehend the nature of the disease and the best methods of suppressing it.

The three thousand or more enthusiasts in Paris were by no means disappointed in the results of this last meeting; they came from the nations encircling the globe; all brought some tribute to the cause, not the least of which was an eagerness to see and know what others were doing, thus to receive stimulation for better work at home. Such inspiration is not necessarily to be gathered wholly from papers read; it comes from intermingling and conversing, with even looking upon the great leaders in the cause and so breathing in enthusiasm by the mere contemplation of the life and work of such men. It is also to be derived from exhibitions, not only of the practical results of labor but also of the scientific attainments recorded from many sources, and again from actual visits to the institutions where work is being done, noting conditions, how far they agree, how better and how far inferior to those at home. So it is that the Congress in Paris may be said to have been interesting, instructive and stimulating by the papers presented, the exhibits of many things relative to the subject, the entertainments in which the members met together, learned to know each other and informally derived new ideas and enthusiasm; and excursions to existing institutions where methods and plans were seen and discussed.

At three o'clock on the afternoon of October 2, 1905, the opening session was held under the direct auspices of the President of the Republic and the officers of Government with such military and other formal surroundings as accompany full state functions. The ambassadors of various countries in official dress, and delegates in full uniform all tended to give picturesqueness and dignity to the first meeting and to emphasize the importance of the movement which the Congress represented. At this session there was little but formal words of welcome and salutations of respect for France and her President. The United States was represented by Dr. Beyer, of the Navy, who in full uniform as Surgeon and Commandant, in a few well chosen words spoken in French brought greetings from America.

The real scientific work of the Congress began the next day, papers being read simultaneously in four sections:

Section 1 being devoted to the medical aspects of tuberculosis;

Section 2 to its surgical aspects;

Section 3 to the protection and aid of children;

And Section 4 to the protection and aid of adults, including social hygiene in its broadest aspects.

To the papers and discussions of these sections I will refer briefly, especially to those representing at this time thoughts which are uppermost in the minds of those working for the prevention and relief of tuberculosis.

Each Congress marks, as it were, a stage of progress in the work. We have the period in which Bremer, Detweiler and others demonstrated the efficacy of the open air treatment of early tuberculosis in specially constructed sanatoria. Then the period following Koch's discovery of the specific cause of the disease. At another Congress Koch advocated tuberculin as a curative agent, and in the period following, this substance was the all absorbing subject of investigation and discussion.

In 1901 Koch made the assertion that the tuberculosis of cattle was to be considered of little or no importance as a factor in the production of the disease in the human race. In the period since, this question largely has occupied the minds of investigators.

In all these periods progress has been making in many correlative branches, and at the various Congresses there has been a form of "rounding up," and a "taking of stock," so to say, of our knowledge as to the whole range of subjects embraced in the study of the disease, its physical and bacteriological nature, its sources and means of transmission, prevention and cure.

That this last Congress will take its place with those preceding it in marking a similar distinct epoch in the work I have no doubt. There are old questions which seem to have been settled and laid aside and others have been brought forward which are new and will need the test of time and much investigation to ascertain their truthfulness and value.

It seems safe to say that one of the most far reaching conclusions arrived at in Paris is that it must be assumed that tuberculosis in cattle may be a source of tuberculosis in man.

We, therefore, start in this new period following this last International Congress with the conviction that the fullest attention must be paid to our milk supply, especially if fed to young children, lest it become a source of infection. Renewed activity should be exercised by our State veterinarians and State boards of health to see to it that the farmers are selling only milk from cows free from tuberculosis. So convinced of this was the medical section that it voted almost unanimously [two dissenting voices], that it was not only indispensable to prevent contagion from man to man, but also necessary to protect the human race against the tuberculosis of cattle by statutes and municipal laws.

In reference to the transmission of the disease directly from man to man there was one paper by Dr. Mongour of Bordeaux which should tend to allay the great fear many have of contracting the disease directly from the affected one. Dr. Mongour studied 440 cases where in the family either the husband or the wife was ill with consumption or had died of this disease. In these 440 instances he found only 16 cases where the partner in marriage was also afflicted; *i. e.*, less than 4 per cent. His conclusion is that consumption is contagious, but that with proper restraints it is so feebly so that parents and friends should be much more calm and courageous. Again, the idea of the inheritance of tuberculosis has received in the Paris Congress many hard blows, and it must be believed that the disease in descendants is mainly dependent upon the greater opportunity of infection and not on the direct transmission of the disease, though it is admitted that a soil favorable to tuberculosis may be inherited.

Additional stress was laid upon early diagnosis, and some new features leading to this desirable end were suggested,

with the view of discovering the cases of consumption even before the individual himself realizes he is ill, for the earlier the disease is discovered the greater the chance of recovery. In this connection it may be said the French lay great stress upon the importance of giving attention to a class which they define as the "pre-tuberculous," meaning by that term those who from one cause or another are so built or so reduced in vitality that they seem likely subjects for infection with tuberculosis. They insist these individuals should be treated much as if they were already tuberculous in order to prevent them from becoming such. If this is done many may be saved from acquiring the disease; young, pale, delicate individuals, or those with greatly reduced chest capacity, particularly children, may readily be classed as "pre-tuberculous," and by judicious care or treatment may be saved the disease.

On the subject of feeding consumptives there seems to have been pretty general agreement that *correct feeding* is much better than *over feeding*, a sin of commission into which one is so likely to fall when the treatment is reduced to the *cure d'air, cure de repos, et cure d'alimentation*, the "therapeutic triad" of sanatorium physicians. In some of the French clinics great faith is placed upon feeding with raw meat and its advocates maintain that they find quicker and surer improvement with its use than with any other food. It is administered either as the pulp of raw meat, or as the juice of the pulp.

Landouzy and other French observers have called attention to the fact that dogs and cats occasionally are subjects of tuberculosis, and they point out that perhaps more frequently than may have been supposed the lap dogs and cats are the source of infection in man.

Particularly interesting were the papers and discussion in the section devoted to childhood. France leads the world in its efforts in this direction, largely through the energy of Professor Grancher, who presided over the section. In a few words I can perhaps sum up the main features which are worthy of attention. As Professor Grancher sees it, tuberculosis is a contagious malady and nearly always contracted by the small child in a contaminated or infected home; that the tuberculosis of adults is most often a tuberculosis of childhood which has remained latent, that in consequence the preservation and protection of the child is the most effective means of combating the disease. Therefore to preserve the child it is necessary,

1. To make the home clean and hygienic.

2. To sterilize the milk the child consumes.

3. If the home is infected, to remove the child as early as possible.

4. To employ such measures as will tend to strengthen the child's constitution.

In order to remove children still well from infected homes, Professor Grancher has established a society which has for its object the care in the country near Paris of poor children taken from such homes. This society assumes that the children it takes are likely from their surroundings to become tuberculous and so by their removal are saved, and in their new environment become strong, healthy individuals. This represents the latest feature in the development of the prevention of tuberculosis and is akin to the treatment of the "pre-tuberculous" to which I have already referred. It is the new idea and one which will be particularly identified with this last Congress. Other measures in use in France for the upbuilding of weakly children are the maintenance at public expense of the so-called *cantines scolaires*, or free lunches, for those who need more food; and the *vacation colonies* by means of which delicate poor children are sent to the country at public expense for three or four weeks each summer.

By the fuller development of these salutary measures much is to be looked for in saving the coming generation. For children already afflicted no country has made such large provision as France. Something like four thousand beds are at the disposal of children either at the seaside or in the hills, and great encouragement is to be found in studying the results of treatment, particularly in cases of surgical tuberculosis, such as hip disease, scrofula, etc. In this country we have but scarcely made a beginning in this work, Dr. Halsted being the first to send such patients to the Adirondacks and Dr. Brannan in New York, having established a small seaside sanatorium at Coney Island. The Floating Hospital in Boston Harbor is also a development in the same direction. I am glad to say, too, Dr. Lowman in Cleveland has taken up Professor Grancher's idea and is advocating the necessity of removing children from infected homes, sending them to the country and indemnifying the parents if the child has been a source of support.

Great stress was laid upon the importance of school hygiene, out-of-door exercises for the child, and *special instruction* in practical hygiene during school life, so that pupils should not have merely some mental pictures of what is necessary, but rather from daily practical experience and teaching should acquire *automatic habits* of the essential features. In this respect we may look to great improvements in our public schools so that they may become to children what sanatoria are to adults, namely, really schools giving instruction in the simple principles of correct living.

This thought brings me to speak of the important discussion held in Section 4 upon the place of the sanatorium and the dispensary in the fight against tuberculosis. It was a most important discussion participated in by the best men of many countries, and the conclusion reached may seem somewhat disappointing to those whose feelings are centered upon the individual sick patient, rather than upon the greater question of stamping out the disease altogether. This conclusion was that whereas many may be improved and cured, the really great value of the sanatorium and dispensary lies in teaching measures by which tuberculosis can be avoided, *i. e.*, in teaching prophylaxis. The real suppression of tuberculosis, therefore, becomes a social problem in which better housing, less crowding, increased wages, better food, wider streets, more

parks, higher intelligence and greater knowledge are the real factors.

The Tuberculosis Exposition held in connection with the Congress was in a larger way an amplification of the Exposition held here in McCoy Hall two years ago. Most European countries contributed, the United States alone omitting to do so, from the fact that no one undertook the task of being responsible for it. Models of sanatoria, charts, maps, reports, tables of statistics, photographs of all sorts, model beds, chairs, rooms, etc., composed the greater part of the exposition, but among the most interesting of all exhibits were the two made by the Pasteur Institute and the Veterinary School at Alfort. In the first were cultures of the tubercle bacillus from every possible source, and in the latter a demonstration of how universally our domestic animals and birds are occasionally afflicted with the disease.

The entertainments and excursions were very enjoyable and instructive. The President of the Congress, Professor Hérard, held a large reception at the Continental Hotel, and the President of the Republic gave a dinner and a large reception at the Elysée Palace. A noteworthy feature of the Congress and one particularly to be approved was the interest taken in the work by the large daily papers—the *Matin* entertaining every one at a theatre performance at which among other things was given Molière's comedy, "Le médicin malgré lui," *The Figaro* giving a reception, and the *Journal* sending a special train to the Riviéra.

At two or three of the previous Congresses there has been one communication which has stood out pre-eminently above all others in interest; in this respect this last Congress did not differ from the preceding. The sensation in Paris was found in Professor von Behring's communication expressing the conviction that he had discovered a substance or a principle which can be used "to protect men threatened with phthisis against the dangerous consequences of tuberculous infection." As yet he is not ready to speak freely of this new substance, for he wishes to make farther researches with it. He names the curative principle T. C. This is what plays the essential rôle in the immunizing action of the bovo-vaccine by means of which he has rendered calves immune to tuberculosis. When this T. C. is introduced into the body it forms in the cells of the body something which he terms T. X., and it is this T. X. which gives the immunity or resistance to the disease, probably a cellular immunity. The T. C. is obtained from the tubercle bacilli and, therefore, it must be assumed that these germs which are in themselves to be considered as *damaging* do contain a substance which is *curative*. It is not a living substance nor self reproducing, but nevertheless "it can be made far superior to the living bacillus in regard to its protective and curative action." In a paper on von Behring's communication Klebs of Chicago concludes with these words, "Considering once more Behring's announcement in the light of his own and other experimental studies, we are allowed to conclude that he has entered on a new line of work and that his further reports will merit great attention. On the whole, it seems that his method is based on principles, elaborated before him by others, especially Metschnikoff and E. Klebs. How much, ultimately, suffering mankind is to profit cannot be predicted, nor can Behring's expressed, though carefully and ambiguously worded expectations, mean anything but a plausible hypothesis, yet unproved by him, of a curative principle, applicable in human tuberculosis."

At the last session of the Congress American representatives presented the invitation of our National Association coupled with Mr. Roosevelt's personal invitation for the next International Congress to be held in Washington. Great enthusiasm greeted these invitations, and it was unanimously voted to go to Washington in 1908.

GOVERNOR JOHN WINTHROP, JR., OF CONNECTICUT, AS A PHYSICIAN.

SECOND PAPER.

By WALTER R. STEINER, A. M., M. D.,

Formerly House Medical Officer, The Johns Hopkins Hospital.

Since writing my first paper on John Winthrop, Jr., as a Physician,[1] I have seen twenty-nine additional Winthrop letters, which all bear on medical topics and show still further the high esteem in which the people held him for his medical knowledge. All of the letters, save three, were addressed to him by those who wanted advice as to treatment for themselves, their families or friends. Two of the remaining three were written by those unknown to Winthrop to some of his acquaintances, asking them for aid in gaining Winthrop's medical advice, while the third letter was written by Winthrop in reply to one included in this list. This collection of medical letters was presented to the Boston Medical Library in 1879 by Hon. R. C. Winthrop, and I am greatly indebted to the late Dr. James R. Chadwick, the former librarian, for his courtesy in allowing me to copy and publish them.

Eighteen of the letters were sent to Winthrop at Pequot (New London), two were addressed to him at Hartford, and eight show no indication as to their final destination. Two were written in 1651, fifteen in 1652, two in 1653, one in 1656, and four in 1663. Windsor, Wethersfield, Saybrook, Hartford,

[1] Steiner, "Governor John Winthrop, Jr., of Connecticut, as a Physician." Johns Hopkins Hospital Bull., 1903, XIV, pp. 294-302.

New Haven and Branford in Connecticut; Springfield, Hadley, Ipswich, Watertown and Rehoboth, in Massachusetts, and Easthampton, Southampton and Southold in Long Island, were the towns in which the writers dwelt. These letters show in eight instances a desire to satisfy Winthrop for his services. Daniel Clark writes: "I wil satisfy his worship for the same, in silver or otherwise, according to his demand," while George Ward, benefited by Winthrop's visit, declares: "If you pleas to show me wherein I may answer your charge and travell I shall be desirous to attend you." Again, Robert Fuller, showing by his letter that he was somewhat illiterate and also poor in this world's goods, declares he will be freely willing in some measure to satisfy Winthrop. William Andrews and his family appear to have been gratuitous patients, as he characterizes Winthrop's services as "a labor of love for us." I have previously given extracts from a number of Goodwin's letters, and some, subsequently written, in this collection, show that Winthrop probably received compensation for his medical labors. In one of them Goodwin wants more medicine for his wife, and adds: "I shall sattisfy for all."

Robert Bond of Easthampton, magistrate of the town as well as gospel minister, sought Winthrop's advice before he removed to Barbadoes on account of an offense, which public sentiment would not condone. For he had previously preached a sermon, not composed by himself, which on its discovery was considered "highly disreputable." He requests aid on a neighbor's behalf, whose children were "destempered with some disease on their heads. It appears to have been a whitish scabb—dry for the most part only uppon their takeinge coullde it have run exceedingly." The duration of the affection was two years and a half and "on the first risinge of it it came in spots like the forme allmost of A ring worme." The scabs gradually increased in thickness and sometimes could be removed by the application of "butter and beare." A violent itching in their heads also troubled the children, most commonly about bed time. Robert Fuller, also anxious about a similar scalp affection, writes a line from Rehoboth. He states his "children's heads, which Winthrop saw, groweth worse, the hair cometh off." His sister, Wheaten, was troubled with small worms and he desired Winthrop to "direct us or her about it."

James Fitch, of Norwich, pastor of the church there, with a tender solicitation for one of his flock, asks Winthrop's help for her "whom its conceaved hath a dropsy which swells her leggs, thighes and bodie up towards the stomacke. Sometimes it does abate and then uppon a catching of cold it increaseth agayne." Her husband, Richard Towslande, had previously received some medicine for her, but as no directions accompanied it he wishes to know how to use it. Fitch also writes about his own stomach trouble. He complained "sometymes with burning heate, sometymes loaded with fleame and much distempered in my heade with fumes of a corrupt stomacke." And Richard Smyth, full of concern about "my son's wife lidia," writes from Wethersfield on February 21, 1652, that she "was full of pain from her navill to ye crowne of her head when the sickness first tooke her. After three restless weeks she felt something to role within her, and her breath was redie to be stopd. after yt she roused and raised corruption and now alate she vomits up bladders about ye bignes of a walnut and some like to a bullet of cleare water and raiseth corruption wth them: She coufs and raiseth filthi stufe." He entreats Winthrop to send her advice and remedies. Sarah Rood, "troubled with ye falling out of ye wome these three years and more after her first child was borne," also besought Winthrop's advice and help, and John Clark writes that his wife had taken the portions of medicine which was sent her, but though they were effectual in causing two attacks of vomiting and three movements of the bowels, "yet she voided no worms at all." As "she thinketh that something bobeles up in hear throt still that makes hear think it must be Chest wormes."

Other women patients than these also demand his attention. Andrew Haniford beseeches "Winthrop's favor to consider the case and condition of his wife, craving his council and advise for what to do." She had been troubled with cold feet for a year and a half. Presently her "whole body became likewise affected and suddenly it turned to a flushing heate and extrem paine and weaknes in her back and a great stoping at her stomocke and when she cannot Raise anything is exceeding sicke and when she doth Raise there cometh up blood with it." She had had a child some months before and about thirty days after childbirth "these could and hote fitts tooke her again and so it continueth with extrem weakness and stoping at her stomocke." "Mrs Whitne's trubble in her head" necessitated her husband to write to Winthrop for medical assistance. "The trubble" was described as "not a payne but a swiming as it wear which as wee conceve is ocashioned from a cloging at her stomake and sum times she is overrun with a sudden flashing heat and she is much overrun with malancolly."

Many male patients, too, pour forth their complaints to Winthrop. John Sherman, minister of the gospel at Watertown, informs our worthy governor on June 30, 1663, that "the hernia I have formerly bin troubled with doth still continue with and grow uppon me: noe meanes hitherto used have availed to doe me any good. The tumor is even without any unequall unshapen excrescence in any part and hath not (to feeling) ye hardnes of a scirhus. It is hardest upwards towards my body, and more soft downward, but doth not pitt or retaine any impression: without inflammation or paine. Mr. Clark (after sight and feeling) hath expressed that he conceiveth it to be mostly wind and water and that a seton might doe me good." Joseph Howard, not gaining benefit from the "fiseke" Winthrop had given him, and being much troubled with his water again desires that some remedies be sent him. He writes: "My watter is verie burning to me and my watter is verie thike and att the last there is some blood and I am very costiff in my bodie. I would entreate you to send me a verie stronge purge and some of that water which I had beffore." In a postscript he adds that the bearer of

the letter "hath a wife who hath a verie greatte swelling in her brest and would desire you to deirect him about it." William Andrews, poor and afflicted with a "distemper, a flucke and loossness one year and 7 months for the most part," writes from New Haven, giving particulars about this distemper, which the "french doctor could only stay for two weeks when it brock out agayne." He wished his case considered and something sent him by "this bearer." If necessary, he is willing to come to Pequot for treatment. Daniel Hovey, from Ipswich, almost a confirmed dyspeptic, states that the remedies Winthrop had sent caused much relief. At present, he adds: "I find much Confluens of wind in my bowels working up and down my stomack thoe not w^th^ such a Juncter of flem and mellancolly as formerly I have therw^th^ bin exsersised . . . . . I find an incapacity to digest and such obstruction of wind allongst w^th^ ye us of food y^t^ oft tims I have thout best to fast away my ilnes and thout it ye only menes for my cur and I think I have oft thuse escaped but herby my body hath bin brought verie low . . . . . At times I am troubled with hart burning ye only remedy against w^ch^ I find ye us of Curnell of 2 or 3 peach stones Curs. I find y^t^ after a tedious fit y^t^ going out I oft find it accompanied with a tedious stitch on my brest somtims on my hart and sometims to sid and chest and about my brest it may be 2 or 3 days w^ch^ provoks to a kind of sigs and then it be tedioussome soe to doe." Nathaniel Bliss, likewise numbered among Winthrop's patients, desires further attention as the "powders" would not work.

Besides these the Wards, father and son, have their afflictions to lay before Winthrop. The father appears to have had some difficulty in micturition, due to an enlarged prostate. He had also suffered from a "bastard pleurisy" the previous spring. While the son's "trubel" is this: "At sometims when I am in my sleep I am for the space of half an houer insensibel of any thing somtims shaking in this tim with my body somtims lying still as on dead. after this in extream pain in my bake: also colde: a pain at my stumake: afterwards in my head: but as the wind doth go from my stumake I have eas again: I hav had 4 of theis fits sinc Januyary last which is all to this tim."

Winthrop was also much sought after to treat many children. William Andrewes, from Hartford, in 1653, desires his daughter, who was staying at Pequot for Winthrop's treatment, to be returned to them by "some Master of the Pinness w^th^ cometh from Pequet to hartford." On May 9 of that year we hear "she returned faint and weak when shee came to us and troubled with a cough." The medicine Winthrop had prescribed had been taken, but the cough had increased. She had also "a payn in her backe and left side" and Andrew feared she was too weak to go again to Pequot, so wished something sent up to her. Summer diarrhoea of infants affecting the little daughter of John Pynchon of Springfield, aged "about or neere one yeare and three quarters old," caused him anxiously to write to Winthrop in 1663. "She hath not bin very well," he says, "these 3 or 4 days, but especially yesterday morning was taken w^th^ a greate looseness and vomiting w^ch^ doth continue much and exceedingly weakens her. She is very restless and unquiet, and sleepes little and is exceding dry craving for drink." Nine years earlier Daniel Clark from Windsor asks Hugh Caukins "to procure me the help of y^t^ worthy instrument (Winthrop) whom I heare is to be highly prized for his great skill." Clark needed Winthrop's aid as his son, aged four years, as well as his daughter, aged about a year and a quarter, were having much trouble from the rapid decay of their teeth. Abigail Montague, too, required Winthrop's medical services, as her child had some eye trouble.

The most interesting letters in this collection refer to the children of Samuel Stone and Richard Odell. The former was assistant to Thomas Hooker, first pastor of the First Church of Christ, in Hartford. Stone[2] was very much worried over his child's illness. He states "the child is 23 weeks old, hath been somewhat ill 3 or 4 weeks, unquiet his eyes looking yellow, having a cough especially when he takes his victuals. Wee thought he might have been breeding teeth: but about a week past we peceived y^t^ he hat the yellow Jaundise. By Mrs Hooker her advise we gave him Barbarie barke boyled in beer, with saffron, twice in a day, for two dayes together: and one time saffron alone. Also lice[3] 2 or 3 times, and Tumerick twice. we hoped y^t^ the Jaundise had been cured: because he was sometimes more chearefull and had a better appetite, but the last Saterdaie at night he was very unquiet, heavie and could not sleep and upon the Sabbath seemed to looke somewhat swart in the face. In the afternoone we gave him about 3 quarters of a grain of your purging powder,[4] which we had of M^rs^ Haynes which caused him to vomit twice or three and to purge downwards thrice—he slept well the night after and in the morning was somewhat unquiet again as before, wringing and winding back, his cough seemes to increase, as if he had much fleagme. he seems to be sick at times but without any convulsion or starting fits. when he began to be ill he was costive in his bodie but now is in good temper. he doth not burne often, but a little sometimes. I pray Sir send me word whether he may not take some more

[2] I have elsewhere (see "Some Early Autopsies in the United States." Johns Hopkins Hosp. Bull., 1903, XIV, pp. 201-203) spoken of the autopsy on Rev. Mr. Stone, which was probably performed by Dr. Bryan Rossiter, of Guilford, Conn. I there quote from Mathers Magnalia: "As for Mr. Stone, if it were *metaphorically* true (what they *proverbially* said) of Beza, that 'he had no gall,' the physicians that opened him after his death found it *literally* true of this worthy man."

[3] "In 1708 Lady Otway gives two receipes for curing jaundice made up mostly of yellow substances. In one she put lemon, tumeric, and saffron; the other consisted of 20 head-lice mixed with nutmeg and sugar and powder of tumerick" (Eggleston. "The Transit of Civilization." New York, 1901. See chapter on "Concerning Medical Notions.")

[4] I take this to be a reference to Winthrop's "sovereigne remedy," Rubila. In another letter, in this collection, John Sherman craves Winthrop's kindness in supplying him with a little of ye red powder, which probably refers also to Rubila.

of that pouder and what quantity. If you thinke it convenient to prescribe anything I pray speake to Mr Blinman. I know he will p^{cure} some Indian to bring your note and I will please him for his journey."

Richard Odell's daughter was troubled with an "ichey humer all over her body." Finally the "humer stoped by degrees but before it was quit stoped shee began to be very plesent and joccund and spoke very plesently the same moment that shee was stricken about the 20 day of October last about 11 or 12 as shee was sitting by the fier shee rise up hastily to fetch som victells shee fell downe upon on side been set up againe she was neither able to stand nor speak and she hath continued till this Instant haveing lost the use of the right side from the head to the foot she hath gained lately som strength on her lieg she can stand wth a littell helpe and is able to sit upright wth her body wthout support—but cannot speak a word she is sensable of feeling through out her lame part it is somthing swelled and very sore in the flesh and hath an exceeding payne in Her other part as in her leg and arme I meane that w^{ch} shee hath use of. She hath also a stopage in her throat or below the swallow when she drinks that she can scarsely induer to drink or take any liquid mater."

To this Winthrop replied in the following letter, which I quote in full:

PEQUOT, Nov. 27. 1652

SIR.—I received your letter about 2 daies since wherin you desire directions concerning your child, wch indeed is very uncertaine to doe in the absence of the pty. it being difficult to find out the true cause & seat of the originall of such disease by the most diligent & curious observations, where the patient is dayly present: for though by your description I judge it to be a palsy, yet the cause of that disease is often very differing for in some it is through too much drinesse in some too much moisture in some the cause is in the Nerves of the third coniugation of the braine sometymes in other nerves, in others it hath its originall in ye marrow of the back bone: this seemes to be that kind wch we call Hemiplegia where one halfe of the spinall marrow is affected, or [wch is often in others, and makes me doubt it may be so in this child; by reason of the suddainnesse wherewth she was stroken] it may come fro a light apoplexye [a stronger Apoplexye is comoly present in death] this lighter kind of Apoplexy strikes suddainly & leaves comonly one side wthout sence or motion, and after continueth it wholy paraliticall: it may also come fro some thick flegms stopping the influence and distribution of ye vitall spiritts in the nerves, wch may also cause that suddaine apoplecticall stupor. The cure depends upon the knowledge of the right cause, and not only that but the constant and due aplication of such things as may conduce thereto wch is difficult to doe at a distance. I am not provided of things alwaies ready for such cures y^{t} are usual to be had ready made in other places at the Apothecaries, and am forced to prepare things myselfe in such case where any neighbours doe want helpe and therefore am not able to send you many things that might be usefull, and I suppose it would be as uselesse to prescribe you such receipt as phisitians comend in those cases, wch I know it is not probable any of them to be had wth you. if the child were were me I might doe mine indeavour to provide such things as I could heare make myselfe and see to the due administration therough, otherwise I accont it an hopelesse to direct for the cure of so dangerous a disease wherin the best meanes often faile of help: some generall things that may be helpfull In all kinds of those diseases I shall mention. there is a Coldnesse comnly accompanes this disease, whatever ther cause be, therfore warmeth by aplication of hares or ffox ffure [wch is also specificall to paralitical disteprs] or in want therof Racoones or lamb or swanes or such as can be had: also artificiall meanes of heat by hott clothes, hott trenchers or brickes wraped up in cloths aplied to the place most benumned also oyntments of hott chimicall oyles as of rosmary tyme Origanū also oyle of castor mixed wth a greater quantity of oyle of wormes & fox grease, or for want of these wth fox grease alone: or w^{ch} is counted very efficatious the Balsam of Guido if you have any [it is an ordinary knowne oyntment] though at present I have none of it but have sent you another oyntment instead thereof with w^{ch} or wth any of the other if they be to be had anoynt the whole backe bone as hott as can be endured & that side that is affected twice a day covering it presently wth hott clothes, also the aplying of cupping glasses to the heads of the muskles, they might be such glasses as have very narrow mouths and must be aplied without scarification, & wth a great & quick flame but must not continue as long as in other cases, but be often reiterated and a plaister of Colophony frankincense & rosin wth the pouder of Bayberries, these mixed wth as much melisett plaister all melted together & made into a plaister, and aplied to the places after the cupping glasses, also some bathes wherin the decoction of Betony Rosmary sage in a quanty of sweete sacke or muskadell but better the spiritts of those herbes & other hott herbes mixed with it: but speciall care must be in the using of a bath least it overcome the patient or too much relax the nerves by being too long in it or too hott aplied: I use in such cases a bath of minerall spiritts w^{ch} I find both safe & effectuall in many cases coming neere the virtue of the naturall bathes w^{ch} must be used immediately after it is prepared, therefore I never prepare it but as it is used, nor cannot contrive a way to supply you wth it so farre of; I commend also to be used inwardly a decoction of Guaicu & Sassaparilla also some drops of the spirit of rosmary in bere if it may be had, or in want of it Rosemary boyled in broth & so taken, a vomitt in some kind of such disease is usefull but not in every kind, an Issue on the contrary arme or legge as the nature of the disease apeares if most upward in the legge if most downward in the arm may be usefull: but if she be of a very spare bode it will not be good: this is what I ca for the present advise. so with loving salutations to yourselfe & wife wth Mr. Howell & thous I rest Your loving friend,

J. WINTHROP.

This letter with an ointment and electuary were received by Odell and by the use of the remedies his daughter improved. Odell later writes she can "both walk and talke," though "she speaks imperfectly and walks lamely." Although her strength had much recovered, yet her arm was almost useless. "She can lift it up to her mouth and can grip with it, but she cannot open it when she would . . . . She is as sencable on that part as in the other I doe conceive that the disease lis mostly in her braine and nerves. She hath her apprehension as well as ever. her memory failes exceedingly that shee cannot express herself as she could. we have use the best meens that the plac can afford. we have wrap her in fox furs and anoynted her with fox grease and have keep her very warme." He was unable to send her down to Winthrop, as his wife could not accompany her and it would "kill her" to go alone.

THE ADVANTAGES OF LOCAL SANATORIA IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

By DAVID R. LYMAN, M. D.,

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In discussing the subject of local sanatoria it will be my purpose to deal with them chiefly in relation to those sufferers from tuberculosis who have not the advantage of independent means, and for whom, as well as for the community in which they live, the problem of their treatment, restoration to health, and return to the ranks of the wage earners is infinitely difficult.

There is no question as to the salutary effect of that old and trusted prescription, "a change of climate" in most cases of tuberculosis; nor that rejuvenation of the whole system, with restoration of the normal powers of resistance which is the chief means through which the sanatorium treatment of tuberculosis reaches its desired goal, can be more quickly attained under those climatic conditions which best fulfill the needs of each individual case. Sanatoria for private patients are now to be found in every country, and in localities of climatic conditions so diverse that the man of means has but to decide which will prove best suited to his needs to avail himself of the advantages it offers.

But for the patient whose means are limited the institutions at which he will be received are few; principally situated at a great distance from his home, and of such relatively limited capacity as to admit of their receiving only a small portion of those who seek their aid. By far the larger majority of consumptives who seek health in the leading resorts spend their time while there in boarding houses, and under conditions which of necessity preclude them from obtaining the great advantage of constant medical supervision and careful schooling in their general habits of life which sanatorium treatment affords.

Before taking up the possibilities and advantages of local sanatoria for the reception of this class of cases, it is necessary to answer one question which is still uppermost in the minds of many of the medical profession and most of the general public; and that is as to their efficiency from a medical standpoint. Can tuberculosis be cured under such conditions? Can it be cured anywhere, except in a few justly noted localities, whose fatal influence on the viability of the tubercle bacillus is so firmly believed in as to cause both physicians and friends frequently to overlook the fatal effects of the journey on the patient?

To find the answer to these questions one has but to consider the location of the many institutions now established for the open air treatment of tuberculosis and compare their results. Contrast for example the Adirondack Cottage Sanitarium with that at Fort Bayard, N. M.; or the Agnes Memorial at Denver with Dr. Millet's Sanatorium at East Bridgewater, on the Massachusetts coast; or again the sanatoria in the Swiss Alps and the Black Forest with those on the banks of the Rhine or with Dr. Phillip's noted institution in the suburbs of Edinburgh. You have localities whose atmospheric conditions and the character of whose soils are wholly dissimilar. Compare their results, and while some will show a greater degree of efficiency than others, yet for similar classes of cases and length of treatment a singular conformity obtains. Surely one must be convinced that for this striking uniformity of their results these institutions do not depend upon the widely different localities in which they are situated, but rather upon some factor common to them all. Further examination proves this to be a fact. We find perhaps each one laying particular stress on some especial feature of the treatment, but all employ the same general routine; rest in the open air, regulated exercise, wholesome food and constant medical supervision whose chief aim is to thoroughly school the patient in the new and rational mode of life so essential to his ultimate recovery.

To those who ask if tuberculosis can be successfully treated under local conditions we can say unhesitatingly, "Yes"; provided that the treatment be carried out under the régime of a modern sanatorium whose situation is such as to combine an atmosphere free from dust and smoke, with ample sun light and good drainage of the soil; and surely such a site is readily accessible to every community.

Having established the feasibility of the successful treatment of tuberculosis wherever the above requirements can be provided, we now come to the consideration of those factors which render the local treatment of its tuberculous members more desirable, not only from the standpoint of the patient, but from that of the community itself.

We must at the outset divide these patients into two distinct classes according to the medical condition they present; the favorable and the far advanced cases; whose distinctive needs demand that they be cared for in absolutely separate institutions. A very brief connection with any sanatorium for incipient tuberculosis will suffice to convince one of the necessity for more adequate provisions for the advanced cases. Institutions for incipient tuberculosis refuse admission each year to as many applicants as they receive, if not more.

Influence of all kinds is brought to bear on those in charge in order to secure admission for these advanced cases, and we are often openly charged with too great a regard for our statistics. And yet, the donors to any charitable work make one universal requirement; evidence that their money is accomplishing definite results. And in this case these results are measured solely by the percentage of cured or arrested cases that these institutions send back to take care of their share of the world's work. Did they fill their beds with the

incurable cases that besiege their doors, they would soon have to close those doors for a lack of financial support.

Beyond all such considerations there are, however, sound medical and economic reasons why the two classes should be cared for separately. They require very different treatment. The early cases need but little nursing, but rather medical supervision combined with a careful training for the needs of their future years. The advanced cases, on the other hand, chiefly require careful and constant nursing and treatment, entailing an entirely different equipment from that required in institutions for the care of incipients. Nor is it right or just to the curable cases to take in the incurable among them. Tuberculosis differs from almost every other disease in that its treatment to be successful must extend over many months under conditions of restraint that grow irksome at times to the most stoical; and it is imperative that the patient's environment be made as cheerful and agreeable as possible. It is impossible for a man who has a given disease, no matter in how slight a degree, to be thrown in daily contact with another, hopelessly sick with the same disease, and watch him sinking nearer and nearer to his end without questioning as to the possibility of his own case eventually reaching the same state; and so in simple justice to the curable cases we must refuse admission to the far-advanced. Almost the greatest medical need of any of the larger towns and cities of this country to-day is that of institutions where far-advanced cases of tuberculosis can be given proper care. The general hospitals cannot receive them unless they be given proper facilities for the purpose. Dispensaries for tuberculosis with their staff of visiting physicians and nurses to care for and instruct the patients in their homes, do great good, but can only reach the few. The only way in which these cases can be adequately cared for is in institutions erected and equipped for that sole purpose.

From a humanitarian standpoint no one who has ever seen an advanced case of tuberculosis struggling for life or for bare comfort in the midst of unfavorable home conditions can ever question their usefulness. But what of the economic side of the question, will it pay in dollars and cents for any corporate community to provide accommodations for these cases? I think that a careful consideration of this question will convince anyone that it will, and pay well.

We can even omit all consideration of loss of earning capacity of the member of the family who must act as nurse; and also the well-known economy of caring for many patients together instead of each one separately. All we need ask consideration of is the enormous saving through placing these cases where they will not constantly imperil the lives of all around them. We have all seen whole families wiped out of existence by the ravages of this disease. And while we know that tuberculosis is preventable, we also know that amongst the poorer classes we find neither the knowledge nor the facilities for its cure or prevention. Any large city that provides adequate means for the care of these cases would, purely from a financial standpoint, be amply repaid in the saving of life and of earning capacity amongst the remaining members of their household.

I look upon hospitals for far-advanced cases of tuberculosis as pre-requisite to the control of the disease.

Let us now consider the question of local sanatoria for the early or curable cases, and see what if any are the advantages they offer over those in distant resorts. What have they to offset the benefit often derived from a marked change of climate?

Their advantages are all derived from the simple fact of their accessibility. It is easier to persuade a patient to go there for treatment. Tuberculosis is often an insidious disease, and its symptoms and physical signs may be apparent to the physician at the time when the patient himself can hardly believe there is anything serious the matter with him. And while he may be persuaded to give up work for a time, yet the expenses and discomfort of a long journey and the separation from his family seem to him hardly necessary. He can be much sooner persuaded to go to a place but a few miles distant and from which he can readily return whenever his health admits; and a difference of a week or two in the commencement of treatment may mean a month or two in the time needed for the arrest of the disease.

Often we find a case that is willing and anxious to go, but who is entirely dependent upon his own scant means. We find him doing extra work at a time when he should be doing none in order to raise the money for railway fares, hotel bills, etc. A local institution saves him not alone the time that he devotes to earning this extra money, but also the sorely needed strength he expends in this extra work, sometimes forever losing his chance of renewed health. More than this, the cost of these travelling expenses would in most cases easily cover the cost of a month or more in a sanatorium, and the permanency of the results of treatment bears a direct ratio to its length.

We find therefore that a patient will be willing to come sooner, and will be able to remain longer in the case of the local institutions.

Another advantage of the local sanatoria is that the patient is not deprived of the comfort of seeing his family and friends. All influences that tend to keep him cheerful and contented have a distinct value for him and must be given due weight. We see cases sent far away from home in whom the element of homesickness or the anxiety concerning home affairs is so strong as to seriously impair the benefits they would otherwise receive, and to these the frequent visits of the family are of great benefit.

The principal value of local treatment from the standpoint of the patient is to be found in this very fact that his friends and relatives can and do visit him. One of the chief dangers to a patient after his return from a distant sanatorium is that those at home have no conception whatever of the life he should lead, or the extreme importance of its routine being closely observed. His letters have been calculated to surprise rather than to instruct. They have told of sitting and sleeping out of doors in all sorts of weather, and have magnified

each circumstance until those at home often feel that his recovery is in spite of and not on account of the life he has led. And when he returns he has to contend against the old established opinions as to night air, etc.—a serious drawback.

Often, too, the family themselves are responsible for the patient's relapse from attempting to resume work too soon. The first fact that impresses a visitor to a sanatorium for tuberculosis is that all the patients there look astonishingly healthy; often more so than the visitor himself. Only the physician can realize how far the improvement in the general health outstrips that in the condition of the disease process, and that the real danger-point in tuberculosis is, as expressed by Babcock, the time when the patient first commences to look and feel perfectly well. Let such a patient return to his home where the burden of his care entails expense, self-denial, and often hardship on the other members of his family, and it is but natural that they should expect and often insist upon one who to their minds seems well, doing the work of a healthy man. Many a relapse in a case of arrested tuberculosis can be traced to just this source. Indeed we find that close proximity to the family can become a serious drawback on this account, for sometimes it is necessary to use every possible argument to induce those most concerned in the patient's recovery to allow him to remain under treatment sufficiently long.

As a rule, however, these visits of the family are of inestimable benefit. They see in actual operation the details of a life in a sanatorium, and how simple, sane and practical it all is. They regard it not so much with curiosity as with interest, for the possibility and advantage of their intelligent co-operation are manifest to them. They are no longer dependent upon the meagre details of the patient's letters, but can discuss the régime of the treatment with the physicians and nurses in person. They come to realize that the eventual cure of the patient entails something more than sitting on a porch for two or three months, and that they themselves have an important part to perform after the patient returns home.

In thus securing for the discharged patient the intelligent co-operation of his family local sanatoria have an advantage over distant institutions that can hardly be over-estimated.

To remain in constant touch with affairs at home is a distinct benefit to the patient in yet another way. Almost without exception when he leaves the sanatorium it is to face the problem of his own support. The average patient arriving at one of the noted resorts brings a letter asking if employment cannot be found by means of which he can pay for his treatment, or when that is ended maintain himself in that climate long enough to perfect his cure. But for every suitable position that offers there are a score of applicants, who only ask that the wages be sufficient to enable them to make both ends meet. Only one can obtain the place. The remaining nineteen must turn their faces homeward where in their prolonged absence the interest of their friends and acquaintances may have become inert. When the friends can visit the patient and watch his improvement from month to month this interest is not only kept alive but stimulated, and we find them interesting their friends in turn, and keeping close watch for all suitable positions that may offer.

Also an occasional visit in person to a former employer results in a patient's old position (if at all suitable) being kept open for him much longer than when his condition and prospects are but indefinitely known.

The ready accessibility of the local institutions is of great benefit to the visitors themselves, and through them to the whole community. They are enabled to appreciate the fact that fresh air and sunlight were not intended solely for the cure of tuberculosis; but that the main principles of sanatorium treatment can be carried out at home to the benefit of the whole household, and as a result we find fresh air and sunshine in homes where they were previously unknown. More than this, the adequate simplicity of the sanitary precautions for the prevention of the disease is impressed upon their minds, and a lively interest in the anti-tuberculosis crusade awakened, thus creating an ever-widening basis of public interest on which to rely for the enactment and enforcement of measures tending to the betterment of the public health.

There is one more important consideration that must not be omitted. It is becoming more and more generally realized that it is not possible to effect a permanent cure of a case of tuberculosis within the few months' term of a sanatorium treatment. The Nomenclature Committee of the National Society recommended the following definition of a "cured" case: "All constitutional symptoms and expectorations with bacilli absent for two years under ordinary conditions of life." This means that the influences which have to bear upon the patient's life and health after his discharge from a sanatorium are of greatest importance, and that whatever tends to lower a patient's general condition, thus rendering him liable to relapse, should be avoided. It is well known that the indefinite influence of a distinct change of climate calls for a readjustment of the whole organism to its requirements; and when we bring a patient back from a totally different climate to resume his work, he has in addition to the increased calls upon his physical strength, to bear the strain of this readjustment. The patient discharged from a local sanatorium has not to contend with this.

There are many to whom these local institutions would be of the greatest benefit whom the distant ones cannot reach at all, and in whose care and control the community is most vitally interested. I refer to the ambulant, curable cases, who, while they would gladly avail themselves of the opportunity to obtain proper treatment, cannot afford to remain in the sanatorium for more than a few weeks. The expense of a long journey would leave no funds to meet their bills and they are forced to remain at home and at work, in utter ignorance of the care they owe to themselves or of the sanitary precautions they owe to their fellow-men. These are the ones whose expectoration upon the side-walks, in the cars, and in public places generally is such a menace to the public health; and in whose care and teaching the community is, therefore, as I have said, so vitally concerned. With railways and hotels no

longer to be provided for, these cases gladly come for the limited term their means will allow; and the benefit to all concerned is very great. Often there is an arrest or an abatement of the activity of the disease; always the patient returns home not only with some definite conception as to the mode of life necessary for his recovery; but with full knowledge as to the simplicity and the importance of the few sanitary precautions so essential to the prevention of the disease. The fact that they reach this class of cases is an advantage of local sanatoria which I would especially emphasize.

I do not wish to be misunderstood as to my opinion of the beneficial effects of climate in the treatment of tuberculosis. I regard it as a distinct benefit to all, and as an essential to some. But for the average patient I hold that treatment in local institutions possesses advantages that more than offset those derived from a change of climate, and that their chief advantages are to the community in or near which they are located. To this they afford a practical demonstration of the value of good hygiene and proper sanitary precautions in the cure and control of tuberculosis; and constantly stimulate an active public interest in all measures tending towards the eradication of the disease.

NOTES ON NEW BOOKS.

Multiple Personality. An Experimental Investigation into the Nature of Human Individuality. By Boris Sidis, M. A., Ph. D., and S. P. Goodhard, Ph. B., M. D. (*New York: D. Appleton & Co., 1905.*)

This volume is of value mainly because of the interesting collection of cases of dual or multiple personality which has been made. Some of these cases, notably that of Hanna, have been detailed at great length and form very interesting subject matter for thought and speculation as to the relations of the different personalities to each other. The authors do not believe that these conditions are necessarily associated with epilepsy and regard them rather as the result of a neuropathic disposition or constitution with consequent instability of the mental life. "The higher constellations and clusters of neurons with their concomitant mental systems are not firmly organized in the principal constellations correlative with the synthetic moment of self-consciousness. Thus the very cerebral organization has an inherent tendency to segmentation or even disintegration, under conditions that would in no way affect more stable organizations. A strong stimulus, or even one of medium intensity, may set up a process of disorganization. . . . . The hurtful stimulus may not be of a violent character, acting suddenly, but of a mild nature, acting for a long time on the neural constellations and finally inducing the phenomena of dissociation and disintegration." Such disorders are common in confirmed alcoholism or in epilepsy. The remedy, according to the authors, is through the employment of a species of hypnotism which they denominate the "hypnoleptic state," by which the intervals between the different personalities are made constantly shorter in duration until finally the different stages merge into each other and the dissociation is over.

The book is interesting and suggestive, but as it is confessedly based upon the single case of Hanna it is not wholly conclusive. It deserves careful reading and thoughtful consideration. The whole subject is still *in nubibus* and the solution of the many problems which it presents must come from an unprejudiced study of further similar cases. In the present volume the pathology and treatment of the condition are sought to be explained by an unproved working hypothesis as to the relations of neurons to each other. Something beyond this is unquestionably needed.

A Non-Surgical Treatise on Diseases of the Prostate Gland and Adnexa. By George Whitfield Overall, A. B., M. D. (*Chicago: Rowe Publishing Company, 1906.*)

A notice of the first edition of this book appeared in Vol. XV, p. 145. The present edition, we are told in the preface, has been revised carefully so that it may portray the author's present methods of practice, including new remedies and new instruments. The intention of the book seems unexceptionable; its apparent defect, however, is its absolute reliance upon non-surgical treatment for the relief of diseases of the prostate and adnexa. Granting that the results of the author's methods of treatment are good, the fact still remains that his methods are not applicable to all diseases of the prostate and adnexa. There are many diseases of the prostate which must have surgical treatment and it is to be regretted that the limitations of non-surgical treatment have not been clearly given.

The Subconscious. By Joseph Jastrow, Professor of Psychology in the University of Wisconsin. (*Boston and New York: Houghton, Mifflin & Co. The Riverside Press, Cambridge, 1906.*)

The author of that entertaining book, "Fact and Fable in Psychology," has now given us a volume on "The Subconscious." So much, either mysterious or nonsensical, has been written about the rare and unusual phenomena associated by the laity with this word that it is pleasing to have before us a discussion of the subject by a psychologist of reputation. Professor Jastrow tells us that subconscious functioning plays a very large part in the normal life of everyone; all degrees of transition, he believes, may be traced from experiences with which everyone is familiar to those remarkable phenomena occasionally observable in abnormal persons, namely, the dissociated consciousness and the altered personality.

The book is divided into three parts: I, Normal; II, Abnormal, and III, Theoretical.

In Part I the author tries to make clear the normal relations of the "subconscious" to our fully "conscious" processes; his task is here "the more precise comprehension of those manifestations of consciousness, and of those varieties of its activities, that take place below the threshold of our fully waking minds." This necessitates a description of the function of consciousness in which he finds the principle of utility effective, a discussion of the relation of consciousness to the nervous system, a chapter on consciousness and volition, and another on the distribution of attention. The mechanism of consciousness is next taken up, after which the author passes at once to the subconscious in mental procedure, deals with the subconscious maturing of thought, describes the lapses of consciousness which occur in normal individuals, and concludes this part of the book with a chapter on self-consciousness.

In Part II the "method of the abnormal" is applied to the

study of the subconscious and the phenomena observable when there is mentally a "quiescence of what is normally active" and a "prominence of what is normally subsidiary" are discussed. The author describes "dream-consciousness," and its variants (hypnagogic hallucinations, delirium and drug-intoxication), then passes on to a consideration of the "dissociated consciousness" (including somnambulism, hypnosis and the hysterical consciousness) and finally takes up the genesis of "altered personality" and the nature of "disintegrating lapses of personality." Among the interesting cases cited, Dr. Morton Prince's "multiple Miss B." occupies a prominent place.

The theoretical interpretation of the phenomena of the subconscious, normal and abnormal, is reserved for Part III. The treatment, though too complex to permit of brief analysis here is interesting and worthy of careful reading by all concerned with normal and morbid psychology. Jastrow asserts that "to secure acceptance, an interpretation of the varieties of subconscious activity must readily find place in a system of mental evolution." The subconscious is, he believes, intimately related to the whole mental economy and participates in even the more developed mental concerns. But it, like all other evolved faculties, is liable to arrest and decay, deformity and enfeeblement. The paths of dissolution are manifold and intricate, often puzzlingly divergent. The author's opinion differs entirely from the theory ordinarily spoken of as that of the "subliminal self," which emphasizes the schism of conflicting personalities as fundamental and regards all such phenomena as exceptional in nature, assuming, to explain them, the existence in the mental constitution from its outset of an entirely separate factor, an influence which becomes articulate only in exceptional circumstances when released from the thrall of ordinary consciousness. For Jastrow, the subconscious is "a natural function with the most intimate relations to consciousness, subject with it to like influences, both parts of a common synthesis, though of unlike service therein."

International Clinics.. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, etc. By leading members of the medical profession throughout the world. Edited by A. O. J. KELLY, A. M., M. D., Philadelphia, U. S. A., with the collaboration of many others. Vol. II. Sixteenth Series, 1906. (*Philadelphia and London: J. B. Lippincott Company, 1906.*)

Reference has often been made in previous issues to the International Clinics which are issued twice each year with commendable regularity. The present volume is fully equal to any one of its predecessors and contains many valuable articles. Among them may be especially mentioned "The Prophylaxis of Nervous Disease, with special reference to educational influences in the growing child," by Dr. Zenner of Cincinnati. "The True Significance of Uric Acid," by Dr. Porter of New York, and "Experimental Researches bearing on Surgical Intervention in Nephritis," by Dr. Rovighi, of Bologna.

The Health-Care of the Baby. A Handbook for Mothers and Nurses. By LOUIS FISCHER, M. D., Attending Physician to the Willard Parker and Riverside Hospitals. (*New York and London: Funk & Wagnalls Company, 1906.*)

This book is written for the use of mothers and nurses, but the subjects are treated in so brief a way that one must have considerable knowledge of the care of infants to be able to make use of the author's advice. However, on the whole, the information given is good, but the book would be improved if some of the themes were discussed more fully.

Medical and Surgical Report of the Presbyterian Hospital in the City of New York. Vol. VII. March, 1896. Edited by JOHN S. THACHER, M. D., and GEORGE WOOLSEY, M. D., (*New York: Trow Directory Printing and Bookbinding Company.*)

The papers contained in this volume are of varying interest, but all do credit to the staff of the Presbyterian Hospital and indicate much activity on the part of its members. While it would be invidious to discriminate between them it is proper to mention several of special value. The "Open-air Treatment of Children in Fever and Convalescence," by Dr. Northrup, treats of a therapeutic measure of growing importance in the successful management of acute diseases. The discussion seems rather general in character and the reader cannot help wishing that more specific information had been given and the limitations of the application of the measure to acute diseases had been more fully considered. The procedure in fact seems dealt with in a popular rather than a scientific manner. It is to be feared that the enthusiasm of the author may lead some less experienced physician to attempt the open-air treatment in cases to which it is not well-suited. The paper on "Sporadic Trichinosis," by Dr. Bovaird, Jr., is an example of careful and painstaking study. It is gratifying to note that the writer gives full credit to the observation of Dr. T. R. Brown as to the diagnostic value of an increased eosinophilia in these cases. Dr. George Woolsey's paper on "Typhoid Perforation" is also worthy of note.

In "Suggested Analgesia," by Dr. Kingsbury, the interesting fact is brought out that however great the value of suggestion may be theoretically, practically the analgesic effects of hypnotism are only manifested in about 10 per cent of those cases which are susceptible to hypnotic influence. As the percentage of persons who can be hypnotized is relatively small, it seems very unlikely that hypnotic suggestion will ever play a very important rôle as a substitute for the use of anæsthetics in surgical operations. The volume contains 234 pages and is attractively printed.

Surgical Suggestions. Practical Brevities in Surgical Diagnosis and Treatment. By WALTER M. BRICKNER, M. D., Chief of Surgical Department Mt. Sinai Hospital Dispensary and ELI MASCHEOWITZ, M. D., Assistant Physician, Mt. Sinai Hospital Dispensary, New York. (*New York Surgery Publishing Company, 1906.*)

These suggestions are terse, often epigrammatic, and constitute interesting reading, however much one may entertain doubts as to the practical utility of concentrated knowledge.

The Medical Diseases of Infancy and Childhood, with points on the Anatomy, Physiology, and Hygiene peculiar to the Developing Period. By ALFRED CLEVELAND COTTON, A. M., M. D. (*Philadelphia and London: J. B. Lippincott Company, 1906.*)

The author has recognized the fact that an understanding of the anatomy, physiology and hygiene peculiar to the developing period is essential to the rational management of children and he presents most of the salient points in a clear and concise manner. We heartily subscribe to his opinion, that infant feeding is a problem of physiology and physiological chemistry and that the knowledge obtained along these lines must be taken into consideration. The importance of such an understanding of the scientific principles which form the basis of the modern conceptions of nutrition prompts us to review this part of the author's work more in detail.

In Part I, Chapter IV, headed "Physiology of the First Year," the statement occurs that a portion of the ingested water is directly absorbed from the surface of the stomach into the blood. This statement is not in accordance with the generally accepted

teachings of physiology. The ferments of the small intestines proper seem to be entirely disregarded in the chapter, and thus the peculiar proteolytic enzyme, erepsin, escapes mention. This enzyme may prove of special interest since casein is one of the two native proteids so far known, which is subject to its action. The author copies freely from a paper by Southworth in regard to the chemical behavior of casein in the presence of acids, rennet and pepsin. We must remember that the results of the experiments of Slyke and Hart on which this paper is based do not necessarily apply to the problem of the digestion of human or cow's milk *by the infant*. In the infant, experiments are still to be conducted in regard to the action of human rennin on human milk, etc., since there seems to exist a certain specificity of the different ferments and there certainly exists a difference in the material to be acted upon. We have only to call attention to the inhibiting action of human milk on the coagulation of cow's milk by means of calf's rennin. The statement that young animals do not secrete any acid at first does not hold good for the human species if we can rely on the old data given by Zweifel and which have since been confirmed. The bacterial flora of the intestinal canal and of the feces, and its significance and the conditions under which this flora changes has received little or no attention. The main bacteria found in the feces of the normal breast-fed infant are, according to the author, *B. lactis aerogenes* and *B. coli communis*, the most abundant *B. bifidus, Tissier* is not mentioned.

With the fifth chapter we enter on the hygiene of the first year. The protection of the infant, the nursery, sleep, clothing, baths and exercise are ably considered. The closing sentence is, "an infant during the first year should neither be amusing nor amused." Sins against this rule are frequent!

Chapter VI is devoted to the natural feeding. The author emphasizes the necessity of intelligent control in regard to the act of suckling. Nevertheless, although "woman's instinct may have become perverted or deranged to a certain extent" in regard to the nursing, the instinct of the baby may frequently be relied upon, and if the mothers could be taught to refrain from inducing and encouraging their infants to nurse, when they have dropped the nipple with the apparent desire to go to sleep, much difficulty would be avoided. A fixed rule is given that the infant should be put to the breast every two hours during the day and once at night during the first six weeks. The actual number of meals under this regime is not stated. The fact that the stomach is found empty one and one-half to two hours after a meal certainly speaks against any more frequent nursing. But it does not indicate any necessity of a two-hour rule. Another reason, not expressedly stated by the author, may be advanced for the two-hour rule, and that is, that the single meal should not exceed the capacity of the stomach. Clinical observations, as well as experiments, in regard to the emptying of the stomach after ingestion of fluids, teach us not to lay too much stress on this latter point, and there does not seem to exist any reason whatever, why we should always adhere to the arbitrary two-hour rule laid down by many writers of text books. While the rule, that the time occupied in nursing and the quantity ingested should be controlled by the mother, is perhaps in most of the cases superfluous, in many instances it may be followed with advantage. The author recommends strongly and justly to give the baby water systematically and freely. When giving the constituents of breast milk a little lapse occurs on the part of the author in classifying lactalbumen and lactoglobulin as whey proteids. While these proteids are found in whey, the term whey-proteid (Molkeneiweiss) was introduced by Hammarsten to designate a certain proteid which supposedly is produced by the action of rennin on casein. The statement, that an infant at the breast digesting well and gaining in weight and strength, is ingesting normal milk, regardless of what the analysis may show, should be taken to heart. The author does not seem to be quite clear in speaking about the reaction of human milk and later of cow's milk. In stating the reaction of milk the indicator must always be given. Thus both milks are alkaline towards lacmoid and acid towards Phenolphtalein. The biological properties of milk have received practically no attention.

In Chapter VII the hygiene of lactation is considered. In this chapter much more stress ought to be laid on the stimulus of suckling to excite the flow of a sufficient milk supply and the dangers of milk stasis are too important not to receive any consideration. Furthermore, it might be well to mention the drugs which are eliminated through the mammary glands.

Chapter VIII treats of milk analysis. The methods of fat determination of Holt, Freser, and Marchand are obsolete and should be discarded. The exact methods for the determination of proteids, ash and sugar should be mentioned, even if briefly. In a chapter on the analysis of breast milk it is just as important to point out how the milk for the analysis should be obtained as to give the methods of analysis. The value of many milk analyses, among others, the widely quoted ones of the Adriances, has been diminished since the publication of Rheyer has called attention to the cautions which have to be observed in collecting the milk.

In Chapter IX supplemental feeding is discussed, also weaning and the contra-indications of weaning. The removal from the breast on account of acute infectious diseases seems to be recommended more on the basis of sentiment than of observation.

Chapters X, XI and XII are devoted to the discussion of artificial feeding. While the author lays much stress on the composition of the food, he strangely omits to give any rules in regard to the total amount of food to be given in 24 hours, or to the amount to be given at a single meal. The author claims to demonstrate the difference between the acid coagula of human and cow's milk by dropping the milk into dilute acetic acid. He is in error on this point in regard to human milk, which gives no coagulum under these conditions.

In talking about the laboratory modification, the methods of which, we may say, have been elaborated by Mr. Gordon, the importance of slight variations in the food is pointed out. If these slight variations are so very important the control analyses of Wentworth make us believe that the accuracy of the method leaves much to be desired. The author is a well-known champion of the use of milk decalcified by means of sodium citrate. But from his exposition of the subject it is evident that he has not a clear conception of the mechanism of the rennin reaction, which has been elucidated by the work of Loevenhart. In other respects the subject of artificial feeding is treated much in the same manner as in other American textbooks. As the author stated previously, scientific infant feeding is a physiological problem, and to obtain the best results we have to take into consideration the data furnished so far by physiology and physiological chemistry. It becomes evident that this problem has to be studied according to the methods in vogue in studying any problem of nutrition, and the peculiarities which belong to the growing organism are to be pointed out. For instance, in adults a very important point is the nitrogen equilibrium, in order to determine the minimal amounts of nitrogenous food necessary. In the growing organism this problem is beset with great difficulties, as a nitrogen equilibrium solely is not sufficient to determine this minimal amount of nitrogenous intake since here the growth demands a nitrogen retention, and the physiological degree of this retention can at present only be fixed arbitrarily. The laboratory modification, as well as the home modifications simply considers how to obtain certain food mixtures, and the relative composition of the food certainly is of importance. But the rules which govern the changes of the formulas are not based on scientific principles, but on clinical observation and therefore they do not offer anything new. The modern efforts to obtain a more scientific basis

for the feeding of infants are neglected by the author. Some of the differences, which exist between human and cow's milk, are also disregarded, as are the differences, which exist between the breast-fed and artificially fed infant. I only need to call attention to the work of Heubner and Rubner and Schlossmann in regard to the energy value of the food and its significance, to the conceptions of Schlossmann, Moro, Hamburger and Wassermann in regard to the biological properties of the milk and their significance; to the work of Moro concerning the difference in the alexins contained in the serum of breast-fed and artificially fed infants, etc., none of which are mentioned. The toxic effect of even small amounts of cow's milk on the young infant in some cases has not received any attention, nor has the importance of the knowledge of the decomposition products of the proteids been pointed out. Unfortunately, the importance of these subjects has been lost sight of in the expressions of mutual admiration so common among American writers and instead of marching in the vanguard of scientific infant feeding, as the author supposes, we, as American physicians, can hardly hold our own in this field of investigation.

In Chapter XIII on the hygiene of later infancy the necessity of the often neglected care of the mouth, nose and nasopharynx is duly emphasized.

In Chapter XIV the physiology and hygiene of childhood are discussed, and the warning of the author in regard to the dangers of overexertion sometimes incurred in the kindergarten courses deserves our fullest attention.

Chapter XV treats of the care of the premature infant, and after a short and concise presentation of the congenital malformations in Chapter XVI, we enter on the second part of the book, "The Diseases of Children."

The chapter on the disorders of nutrition is rather short. Just here the influence of a faulty diet with its consequences should find its place. It may perhaps be of advantage to reserve the term "marasmus" for those atrophic conditions of the infant, the etiology of which has not been elucidated, while the secondary forms of this state may be better considered from an etiological point of view. In an otherwise well-written chapter on rhachitis, the early manifestations of this disease with the prominence of the craniotabes are somewhat neglected. The author cites the sterilization of the milk as a factor in the etiology of scurvy. Since recent research has robbed this factor of its preeminence we note with satisfaction that he does not give it the usual prominence. The author is of the opinion that a multitude of clinical facts lend their support to the idea that more or less severe disturbances may be due to difficult dentition. Since the work of Jacobi, Kassowitz and others, it becomes necessary to base such an opinion on a number of carefully observed cases fully reported in literature. Otherwise we cannot acknowledge this multitude of clinical facts. The disturbances caused by adenoid vegetations have received the prominent notice they deserve. The possible etiological factors of summer diarrhœa are shortly though ably discussed. The author arrives at the following conclusion: "Whatever the future may reveal, for the present, at least, the etiology of summer diarrhœa, in its protean forms and lesions, must be regarded as multiplex and more or less obscure as to the relationship of its several factors." This statement voices the conviction of many pediatrists.

In the treatment of laryngismus stridulus we miss the phosphorus medication which has proven beneficial in a great number of cases. The space allotted to the description of tuberculous meningitis—24 lines—is hardly sufficient to illuminate a disease of so many aspects. The therapeutic value of the lumbar puncture in cases of meningitis is not discussed.

The chapter on syphilis seems to have been written before the era of the spirochæta pallida. The bone-lesions as well as the skin eruptions of hereditary syphilis receive rather short treatment.

In regard to the dissemination of tuberculosis the author adheres to the views of Cornet according to whom the infection is mostly carried through dried and pulverized sputum. Flügge's "Tröpfchen" infection is not considered. The author expresses himself very guardedly in regard to the mode of infection in early life. He regards the tuberculin test as of doubtful propriety. Two forms of peritoneal tuberculosis are given, namely, the wet and dry form, or the ascitic and the plastic. As a rule, a third form is accepted, characterized by ulceration and caseation.

The author is rather sanguine in the expression of a hope that diabetes mellitus may perhaps be avoided by controlling the child's development through attention to hygiene.

An appendix is added to the book, in which the author gives directions as to sick-room hygiene, therapeutic suggestions and recipes for the preparation of certain foods, ending up by giving a few formulas for prescriptions.

In this review the main stress is laid on the scientific principles of infant feeding. In justice to the author it must be stated that his presentation of this part of the subject does not differ materially from what we are accustomed to find in most of our text-books. Therefore, the criticism is not so much directed against the author's efforts as against the more or less general disregard of the scientific principles involved in infant feeding so common in works of this kind. It is apparent throughout the book that the author draws on an extensive clinical experience. Although some of his opinions may be debatable, his conclusions are given in a clear and conservative manner, and his book may be perused with advantage.

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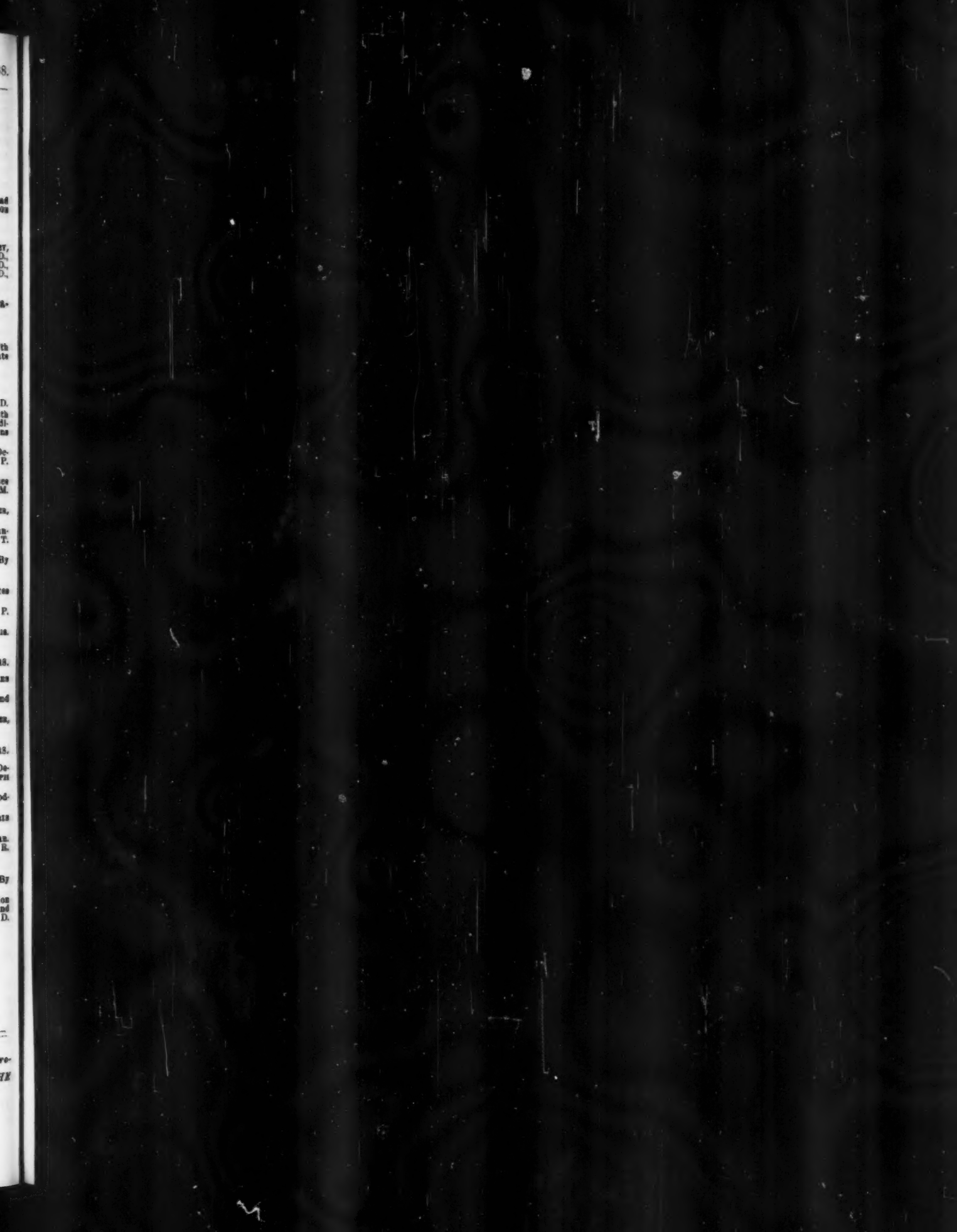
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